

Piperine analogs from *Piper chaba* activates TRPA1

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Most famous thermosensitive TRP (transient receptor potential) channel is TRPV1. TRPV1 is activated not only by temperature (>43°C) and H⁺ but also by some food components including capsaicin in hot pepper. Capsaicin enhances energy metabolism through activation of TRPV1. TRP cation channel subfamily A member 1 (TRPA1) is a kind of thermosensitive TRP channel families. TRPA1 is co-expressed with TRPV1 in sensory nerve endings. Accordingly, we are looking for TRPA1 activation compounds from foods as candidates for energy metabolism enhancer. We have already found that some piperine analogs from *Piper chaba* activate TRPV1. We studied piperine analogs from *Piper chaba* on TRPA1 activation.

Stable Chinese hamster ovarian (CHO) cell lines expressing full length human TRPA1 was generated using tetracycline inducible T-RExTM expression system from Invitrogen. Intracellular Ca²⁺ concentration was measured by Flex Station IITM (Molecular Device, USA). In 96-well plates, CHO cells were seeded and cultured. By adding tetracycline, TRPA1 expression was induced. After loading Fluo-4 AM (Ca²⁺ indicator) to cells, sample solutions were added to cells and changes of fluorescence was monitored continuously. Allyl isothiocyanate (AITC, 100 μM) was added to elicit maximum fluorescence intensity.

Eight of 19 compounds from *Piper chaba* activated TRPA1. The EC₅₀ values were 15 to 90 times larger than that of AITC. Maximal response values were almost equal to that of AITC. These results show that some piperine analogs are TRPA1 agonists having a little small efficacy to AITC.